



# Best Management Practices for Construction and Development Projects Affecting Missouri Rivers and Streams

## Purpose and Use

The information in this document is to be used to help avoid and minimize species impacts due to construction practices. It is not intended as a guide to manage habitat for a given species. Please contact the Department of Conservation if habitat management information is needed. Because every project and location differ, following the recommendations in this document does not guarantee impacts will not occur to the species and additional information may be required in certain instances. Following the recommendations in this document does not complete Endangered Species Act consultation that may be necessary for species listed under the federal Endangered Species Act; please contact the U.S. Fish and Wildlife Service for more information.

## Introduction

The streams and rivers of Missouri support a wide and diverse community of wildlife that includes many species of fishes, mussels, turtles, amphibians, crayfish, insects, mammals, and birds. The continued diversity and health of this community is dependent upon how well Missourians manage and protect this resource. While water quality is essential, maintaining a diverse array of habitat features is also essential for aquatic wildlife to persist. Since implementation of the Clean Water Act, point source pollution has been greatly reduced, but polluted and sediment-laden runoff (non-point source) from rural and urban development remains a serious problem.

## Access and Staging Area Management Recommendations

Staging areas are those short- or long-term sites within a construction or development area where most equipment and materials are stored. These areas are accessed frequently; and when fuel and oil are stored here, the potential for runoff and erosion in these areas may be high.

- Erosion and sediment controls should be installed and maintained to prevent discharge from the site.
- Staging areas for crew, equipment, and materials should be established well away from streams and rivers or highly erodible soils.
- Stationary fuel and oil storage containers should remain within a staging area or another confined area to avoid accidental spills into stream systems.
- Excess concrete and wash water from trucks and other concrete mixing equipment should be disposed of where this material cannot enter the stream systems.
- If temporary roadways must be built, ensure that roadways are of low gradient with sufficient roadbed and storm water runoff drains and outlets.
- Containment basins, silt fences, filter strips, etc. should be included for retention of storm water runoff for reducing sediment introduction into natural waterways.

- Avoid stream crossings. If unavoidable, temporary crossings should be used. Temporary crossings should not restrict or interrupt natural stream flow. If temporary in-channel fill is necessary, culverts of sufficient size should be employed to avoid water impoundment and allow for fish passage.

## Riparian Corridor Management Recommendations

The riparian corridor is the vegetation adjacent to a stream or river, which is critical to the health and quality of the aquatic environment because of its ability to slow and reduce sediment and chemical runoff into the stream or river channel.

- A riparian corridor with a minimum width of 100 feet from the edge of the stream or river should be maintained along both sides of streams and rivers.
- Limit clearing of vegetation, including both standing and downed timber, to that which is absolutely necessary for construction purposes.
- Heavy equipment use within the riparian corridor should be restricted to minimize vegetation destruction and compaction of soils.
- General application of pesticides, herbicides, or fertilizers within the riparian corridor should be prohibited to avoid water contamination due to overspray or runoff. Spot application of fertilizers, pesticides and herbicides is acceptable if appropriate non-restricted chemicals are used.
- Riparian areas located down slope of construction zones should be physically screened with sediment controls, such as silt fences or filter strips, monitored after rain and maintained for the duration of the project.
- All riparian corridors disturbed by the project should be revegetated immediately following or concurrent with project implementation. Appropriate native bottomland or riparian trees, shrubs, and grasses should be planted to ensure long-term stability in areas where the soil erosion threat is not critical. Annual non-native grasses such as rye or wheat may be planted in conjunction with native species to provide short-term erosion control.
- Post-construction evaluation of vegetation establishment should be conducted at one-month intervals for at least three months after completion of the project. Any recommended sediment controls should be inspected at these times. If determined beneficial to soil stability and not adversely impacting site function and/or aesthetics, recommended sediment controls should remain permanent.
- All temporary erosion and sediment controls should be removed (unless removal would cause further disturbance) and properly disposed of within 30 days after final site stabilization is achieved or after temporary practices are no longer needed.

## Bank and Channel Management

### Recommendations

The structure of a bank is an important feature of a stream or river. It defines and provides stability for the channel.

- Bank stability will vary depending on height, slope, and soil conditions. Project engineers and hydrologists should thoroughly investigate the physical properties and hydrologic record of the proposed site before construction begins.
- Limit clearing of vegetation, including both standing and downed timber, to that which is absolutely necessary for construction purposes.
- Projects in which bank alteration is necessary should employ, to the highest degree possible, erosion prevention measures before actual excavation activities begin. These measures should be monitored and maintained for the duration of the project.
- Use of riprap for stream bank stabilization should be limited to those areas that could experience substantial erosion before adequate vegetation becomes established. The material for the rock blanket should consist of durable stone. It is preferable that 40-60 percent of the material be as large as the thickness of the blanket, with enough smaller pieces of various sizes to fill the larger voids. Bank stabilization materials should allow for continuous passage of fish and other aquatic species.
- No permanent fill materials, other than design-approved structures and related bank stabilization materials should be placed in the stream channel. Avoid channelization, channel re-alignment, and channel reaming. Excavated materials should not be stored or stockpiled below the high bank.
- Work should be conducted during low flow periods when possible.
- Care should be taken to keep machinery out of the waterway as much as possible.
- Do not alter or remove natural stream features, such as riffles and pools.
- Large woody debris is an important habitat component of a stream and should not be removed unless absolutely necessary for construction and maintenance purposes.

### General Recommendations

If your project involves the use of Federal Highway Administration transportation funds, these recommendations may not fulfill all contract requirements. Please contact the Missouri Department of Transportation at 573-526-4778 or the [Missouri Department of Transportation Environmental Studies webpage](#) for additional information on recommendations.

### Information Contacts

For further information regarding regulations for development in rivers and streams, contact:

For species information:

[Missouri Department of Conservation](#)

Science Branch  
P.O. Box 180  
Jefferson City, MO 65102-0180  
Telephone: 573-751-4115

For species information and Endangered Species Act Coordination:

[U.S. Fish and Wildlife Service](#)

Ecological Services  
101 Park Deville Drive, Suite A  
Columbia, MO 65203-0007  
Telephone: 573-234-2132

For Clean Water Act Coordination:

[Missouri Department of Natural Resources](#)

Water Protection Program  
P.O. Box 176  
Jefferson City, MO 65102-0176  
Telephone: 573-751-1300, 800-361-4827

[U.S. Army Corps of Engineers](#)

Regulatory Branch  
700 Federal Building  
Kansas City, MO 64106-2896  
Telephone: 816-389-3990

[U.S. Environmental Protection Agency](#)

EPA Region 7 Water Division  
11201 Renner Boulevard  
Lenexa, KS 66219  
Telephone: 913-551-7977

### Disclaimer

These Best Management Practices were prepared by the Missouri Department of Conservation with assistance from state and federal agencies, contractors, and others to provide guidance to those who wish to voluntarily act to protect wildlife and habitat. Compliance with these Best Management Practices is not required by the Missouri wildlife and forestry law nor by any regulation of the Missouri Conservation Commission. Federal laws such as the Clean Water Act and the Endangered Species Act, and state or Local laws need to be considered for construction and development projects and require permits and/or consultation with the appropriate agency. Following the recommendations provided in this document will help reduce and avoid project impacts to the species, but impacts may still occur. Please contact the appropriate agency for further coordination and to complete compliance requirements.